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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/879,934	06/14/2001	Yasumi Sago	K-1984	4444
32628	7590	10/19/2004	EXAMINER	
HAUPTMAN KANESAKA BERNER PATENT AGENTS SUITE 300, 1700 DIAGONAL RD ALEXANDRIA, VA 22314-2848			KACKAR, RAM N	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 10/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/879,934

Applicant(s)

SAGO ET AL.

Examiner

Ram N Kackar

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on 04 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 29-35, 37-39, 41-50, 52-54 and 56-58 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 29-35, 37-39, 41-50, 52-54 and 56-58 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/04/2004 has been entered.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 29, 31, 33-34, 37-39, 41-44, 46, 48-49, 52-54 and 56-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mountsier et al (US 5810933) in view of Moslehi (US 5936829).

Mountsier et al disclose an electrostatic chuck (Fig 1 and Col 1 lines 39-54), comprising a dielectric layer (Fig 1-4), chucking electrode (Fig 1-2), temperature control (Col 1 line 41 and Col 8 lines 40-49), chucking power source (Fig 1-14), marginal convex (Fig 11b-78), chucking surface concaves for heat exchange gas (Fig 11b), under pressure (Col 7 line 48), gas distribution concave (Fig 11b -74) which are deeper than heat exchange concaves (Fig 11b), gas distribution concaves formed in coaxial with the center of the stage (Fig 7), gas inlets connected to gas

Art Unit: 1763

diffusion concaves at positions off the center of the stage (Fig 19a- 82 and Col 13 lines 50-60), the depth of heat exchange concaves being below 40  $\mu\text{m}$  (Col 10 line 65) and the depth of gas diffusion concaves being 700  $\mu\text{m}$  (Col 13 line 14), the contact area being 10% (Col 9 line 42), main body cooling cavity (Fig 3) and a heat conducting layer between dielectric and main body for cooling (Fig 5-54).

Area of gas diffusion concaves is indirectly disclosed to be at least 5% (on a wafer of 200 mm diameter (Col 11 line 37) and diffusion concave width of 0.5 to 2.5 mm (Col 13 line 16) and plan view of Fig 15a to 19 b will yield an estimate of at least 5%).

Mountsier et al disclose radial and circumferential gas diffusion concaves inside an outer circumferential concave, an inner circumferential concave (Fig 17a and 19a – the hexagonal shaped) and several alternative gas distribution structures, but do not explicitly disclose a plurality of inner circumferential concaves.

Moslehi discloses another chuck and discloses a plurality of circumferential concaves (Fig 3) containing gas inlet connected at the crossing of circumferential and radial concave (Fig 3-74).

Since additional inner circumferential concaves is an alternative and equivalent way for distributing heat transfer gas and helps in obtaining better uniformity closer to center as disclosed by Moslehi too, it would have been obvious for one of ordinary skill in the art at the time of invention to have additional circumferential concaves.

4 Claims 30, 32, 35, 45, 47 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mountsier et al (US 5810933) in view of Moslehi (US 5936829) as applied to

Art Unit: 1763

claim Claims 29, 31, 33-34, 36-44, 46 and 48-49 and further in view of Sexton et al (US 6377437).

Mountsier et al in view of Moslehi is discussed above.

Mountsier et al as modified by Moslehi do not disclose lift pin provided in gas introduction channel.

Sexton et al disclose cooling gas flowing through lift pin holes (Abstract and Fig 9-46).

Therefore it would have been obvious for one with ordinary skill in the art at the time invention was made to use gas channel hole for dual purpose of lift pin hole as well as cooling gas channel to make the design simpler and economical.

### ***Response to Amendment***

Applicant's arguments filed 10/04/2004 have been fully considered but they are not persuasive.

The applicant argues that in prior art does not specifically disclose heat exchange concaves to be 1-20  $\mu\text{m}$ .

Mountsier et al clearly disclose the heat exchange concaves to be shallower than 40  $\mu\text{m}$  (Col 10 line 65) and also teach the effect of heat exchange concaves depth (5-100  $\mu\text{m}$ ) and pressure on heat transfer coefficient (Fig 9 and Col 7 lines 30-56). In the viscous region above a pressure of 1 Torr, for a smaller gap heat transfer coefficient is higher. Therefore from the point of heat transfer smaller gap would be desirable.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N Kackar whose telephone number is 571 272 1436. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 571 272 1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RK

Ram N. Kackar

AU 1763